

$$P_A = .9 \times 10^5 \text{ Pa}$$

$$V_A = 48 \times 10^{-3} \text{ m}^3$$

$$T_A = 520 \text{ K}$$

$$P_B = .3 \times 10^5 \text{ Pa}$$

$$V_B = 96 \times 10^{-3} \text{ m}^3$$

$$T_B = 347 \text{ K}$$

a) $W = -P \cdot \Delta V$ and Volume is increasing

$$W = -P \cdot (+) \quad \text{so} \quad \boxed{W = -}$$

b) ΔU depends on temp, and temp is decreasing

$$\boxed{\Delta U = -}$$

c) By definition of adiabatic:

$$\boxed{Q = 0}$$

d) for BA, Volume decreases, and $W = -P \cdot \Delta V$

$$= -P \cdot (-)$$

$$\boxed{W = +}$$

e) for BA, temp is increasing, and ΔU depends on temp

$$\boxed{\Delta U = +}$$

f) By definition of adiabatic:

$$\boxed{Q = 0}$$